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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,608	03/02/2005	Andreas Lucht	AFK-16214-WO-US	8772
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/522,608

Applicant(s)

LUCHT ET AL.

Examiner

SCOTT HAUGLAND

Art Unit

3654

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-20 and 22-32 is/are pending in the application.
- 4a) Of the above claim(s) 23-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-20, 22, and 28-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Claims 23-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on 4/28/08.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 17-20, 22, and 28-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 17, lines 7-8 includes new matter because the application as originally filed does not disclose that the spiral toothing is fixedly disposed on the carrier shaft.

Claim 17, lines 39-41 includes new matter because the application as originally filed does not disclose that only the first thread of the spiral toothing on an end of the spiral toothing is in contact with the frictional component and acts in an axial direction

against the frictional component. The application as originally filed discloses that the first thread of the spiral toothing is not the only element that is in contact with the frictional component and acts in an axial direction against the frictional component and that the counter-bearing 23 is also in contact with the frictional component and acts in an axial direction.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 17-20, 22, and 28-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The fixed counter-bearing is not sufficient structure to perform the function of preventing reversal of the first rotation direction of the carrier shaft as recited in claim 17, lines 18-19.

The language of claim 17, lines 18-19, claim 17, lines 23-24, claim 17, line 36, and claim 17, lines 44-45 appears to be inconsistent because rotation of the carrier shaft cannot occur if prevented.

The language "an axial component in a rotational force" of claim 17, lines 41 is unclear. It appears to refer to an axial component of the force applied by the spiral toothing against the frictional component.

The language of claim 22, lines 2-3 is unclear or inaccurate because the coefficient of friction depends on the characteristics of both contacting surfaces and other factors.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17, 22, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernandez (U.S. Pat. No. 5,005,777) in view of either Burr et al (U.S. Pat. No. 4,217,788) or Buchanan, Jr. (U.S. Pat. No. 5,605,071).

Regarding claim 17, Fernandez discloses a belt shaft retractor having a blocking system (including portions of control system 28) that is controlled in a vehicle sensitive and/or belt strap sensitive manner, comprising: a belt shaft 41; a tensioning device that acts on the belt shaft and is configured for carrying out a reversible pretensioning of a vehicle occupant; a carrier shaft 18 having a spiral toothing 54 and that meshes with an external toothing 52 of the belt shaft 41; an electric motor 26 as a drive for the tensioning device, wherein said electric motor is adapted to be coupled to said belt shaft via said spiral toothing, wherein said electric motor is adapted to act upon the carrier shaft, wherein the electric motor is further adapted to rotate the carrier shaft in a first

rotation direction during the pretensioning to facilitate rotation of the carrier shaft during pretensioning; a fixed counter-bearing 16 configured as means to prevent said reversal of said first rotation direction of said carrier shaft (the counter-bearing is capable of this use), wherein said spiral toothing is supported indirectly against said counter-bearing such that upon an occurrence of an axial loading of said spiral toothing directed toward said counter-bearing due to a load exerted on said belt shaft in a belt withdrawal direction by a vehicle occupant after completion of pretensioning, a rotation of said spiral toothing is prevented via a supporting force (col. 11, lines 53-63); a frictional component 56, 58 disposed between said counter-bearing and a first thread of said spiral toothing 54 for increasing a level of friction between said counter-bearing and said first thread of said spiral toothing until said level of friction is sufficient to prevent further movement and rotation of the carrier shaft (note that the friction is sufficient to prevent rotation; see col. 11, lines 53-63) upon a reversal in a direction of rotation of said carrier shaft after completion of the pretensioning, wherein only the first thread of the spiral toothing on an end of the spiral toothing is in contact with said frictional component (to the extent that this is the case in applicants' apparatus) and acts in an axial direction against the frictional component to produce an axial force, wherein said axial force counteracts the supporting force as a reaction force, wherein due to a direction of lead of the spiral toothing, a rotation of the spiral toothing in a pretensioning direction is enabled and rotation of the spiral toothing in a direction opposite to said pretensioning direction is prevented by exertion of said load.

Regarding claim 22, said frictional component 56, 58 is a spacer disk of a material that appears to have a non-linear coefficient of friction, such that as axial forces applied on said spacer disk increase, frictional forces increase exponentially. The friction forces generated by the contact of the spacer disk, counter-bearing, and spiral toothing are dependent upon at least the materials of all of the contacting components, their surface textures, and geometries. Exponential functions can take many widely differing forms. It appears that the claim requires little if any more than a material that is capable of producing non-linear variation in friction force of which the material of 56, 58 in Fernandez is capable.

With regard to claims 28, inherent friction in the motor would provide a holding moment and the motor is capable of being energized to apply a holding moment to prevent rotation of the spiral toothing against at least some loads.

With regard to claim 29, the motor control in 28 adjusts the holding moment generated by the motor as a function of the load on the belt shaft (e.g., note col. 8, lines 30-50).

Claims 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fernandez (U.S. Pat. No. 5,005,777) in view of either Burr et al (U.S. Pat. No. 4,217,788) or Buchanan, Jr. (U.S. Pat. No. 5,605,071) as applied to claim 17 above, and further in view of the admitted prior art of page 6, last para. of the specification.

Regarding claim 22, said frictional component 56, 58 is a spacer disk.

Assuming, arguendo, that the material of the spacer disk does not have coefficient of friction such that as axial forces applied on said spacer disk increase, frictional forces increase exponentially, the admitted prior art teaches materials having a non-linear coefficient of friction, such that as axial forces are applied frictional forces increase exponentially.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the safety belt retractor of Fernandez with a spacer disk of a material having a non-linear coefficient of friction, such that as axial forces applied on said spacer disk increase, frictional forces increase exponentially as taught by the admitted prior art to provide adequate friction to prevent reverse rotation of the spiral toothing. Selection of an appropriate material to provide the required friction force would be well within the level of skill of an ordinary artisan.

Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernandez in view of either Burr et al or Buchanan, Jr. as applied to claim 17 above, and further in view of Kanada et al (U.S. Pat. No. 4,546,933).

Fernandez does not disclose miter-wheel gearing coupling a drive shaft of the electric motor to the spiral toothing.

Kanada et al teaches coupling a motor and spiral toothing in a seat belt retractor via miter-wheel gearing 42, 44.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Fernandez with miter-wheel gearing coupling a drive

shaft of the electric motor to the spiral toothing as taught by Kanada et al to permit a more compact arrangement of the motor parallel to the belt shaft.

Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernandez in view of either Burr et al or Buchanan, Jr. and in view of Kanada et al as applied to claim 20 above, and further in view of Andrei-Alexandru et al (U.S. Pat. No. 4,652,781).

Fernandez does not explicitly disclose that there is a thrust bearing surrounded by a bearing housing between the spiral toothing 54 and gear 20 end of the carrier shaft 18.

Andrei-Alexandru et al teaches mounting a carrier shaft for a spiral toothing in a ball joint bearing (16, 17) in a bearing housing.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Fernandez with a ball joint or cup-shaped bearing in a bearing housing formed by the seat belt retractor frame as taught by Andrei-Alexandru et al to support the carrier shaft 18 between spiral toothing 54 and gear 20 in a self-aligning manner.

Response to Arguments

Applicants' arguments filed 12/22/10 have been fully considered but they are not persuasive.

Applicants argue that the carrier shaft 18 is non-displaceable and the spiral toothing is fixedly disposed on the carrier shaft 18 (last para. of p. 7 of the remarks). However, this is not disclosed and only the spiral toothing being fixedly disposed on the carrier shaft is claimed (claim 17, lines 7-8). Claim 17 has been rejected for including new matter. Additionally, such a device would not operate as described in applicants' specification since the spiral toothing must be free to vary pressure against the spacer disk.

Applicants argue (last para. of p. 8 of the remarks) that, in Fernandez, rotation of the spiral toothing in one direction is not provided. However, applicants' argument are not fully understood. Applicants appear to be comparing different aspects of applicants' apparatus and Fernandez. Fernandez has a locking worm and gear which would prevent reverse rotation of the belt reel. This corresponds to applicants' claimed spiral toothing and external toothing of the belt shaft. The feature of Fernandez in which a control system responds to force applied to the belt to operate the drive motor in the unwinding direction to allow a vehicle occupant to unwind the belt from the reel corresponds to a feature that is not specifically addressed in applicants' disclosure. Are applicants suggesting that there is no provision in their retractor for unwinding the belt from the belt reel to allow an occupant to use the belt? Clearly, in order to provide a functioning seat belt retractor, some provision must be made to allow unwinding of the belt. Rotating the motor in the unwinding direction (as in Fernandez) is one possibility. In any case, the spiral toothing and meshing gear (worm and worm wheel) in Fernandez

prevent rotation of the spool and unwinding of the belt in the event of a crash (col. 11, lines 53-63).

Applicants argue (last para. of p. 9) that Burr teaches a separate friction brake to prevent rotation of a carrier shaft for a spiral (worm) gear. However, it is noted that applicants' also provide a separate brake (including disk 25) for this purpose. Fernandez has the claimed frictional component (56, 58; friction is inherent because of the contact with the spiral toothing). The teaching of Burr (or Buchanan) suggests using this friction to allow the use of more efficient worm and worm wheels that are not self-locking by themselves.

Applicants argue that Buchanan is not related to the (p. 10, para. 3) object of the invention of increasing friction such that rotation of a worm in a reverse direction is prevented. However, as noted in the Office action of 9/24/10, this is what is discussed at col. 1, line 50 - col. 2, line 1 of Buchanan, i.e., that friction in a drive train outside of a worm and worm wheel can be used to compensate for the use of a worm and worm wheel that are not self-locking by themselves so that the drive train as a whole is self-locking. The friction between 56, 58 and the worm in Fernandez inherently provides friction and, therefore, inherently compensates for a worm and worm wheel that are not self-locking. Buchanan teaches exploiting this fact to allow any desired worm and worm wheel to be used.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. The new grounds of rejection were necessitated by the amendments to claims 17 and 22. Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT HAUGLAND whose telephone number is (571)272-6945. The examiner can normally be reached on Mon. - Fri., 10:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mansen can be reached on (571) 272-6608. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael R Mansen/
Supervisory Patent Examiner, Art Unit 3654

/SJH/